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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,728

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INTELLECTUAL PROPERTY SECTION,
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EXAMINER

PARVINI, PEGAH

ART UNIT

PAPER NUMBER

1755

MAIL DATE

DELIVERY MODE

05/09/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,728	Applicant(s) SAHA ET AL.	
	Examiner Pegah Parvini	Art Unit 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 31 is/are pending in the application.
- 4a) Of the above claim(s) 18-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-16 and 31 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20060126, 20070205</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 26 January 2006 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because some references have not been indicated by the patent or publication number. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Election/Restrictions

2. Applicant's election with traverse of claims 17-30 in the reply filed on April 25, 2007 is acknowledged.

3. Applicant's election of claims 1-16, and 31 in the reply filed on April 25, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 8-10, and 12-16 are rejected under 35 U.S.C. 102(b) as being unpatentable by US Patent Application Publication No. 2001/0038810 to Wallin et al.

6. Regarding claim 1, Wallin et al. teach porous ceramic grains which are substantially acicular in which an element such as Ce, Mg, Ca, iron, scandium, etc may be incorporated into the lattice structure of the catalyst (paragraphs [0024], [0025], [0028], [0031], [0032]). Furthermore, Wallin et al. teach the use of precursor compounds such as clay, zeolites, alumina, silica, aluminum trifluoride, and fluorotopaz in the mixture when forming mullite porous catalyst support ([0045]). It is, further, noted that Wallin et al. disclose that in making such a porous catalyst support, precursor compounds are generally mixed, then shaped into a porous shape by any suitable method, and then is heated sufficiently to form the acicular ceramic grains of the support ([0043] to [0048]). In addition, Wallin et al. points to the fact that when the support is mullite, the precursor compounds contain Al, Si, and oxygen which are mixed to form a mixture capable of forming fluorotopaz and substantially mullite ([0043]). The

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mixture is heated under an atmosphere sufficient to form the porous catalyst support in the presence of fluorine, which is provided through the SiF_4 source ([0048]). Wallin et al., also, disclose that the metal elements are chemically bounded to the ceramic grains of the porous catalyst ([0037]).

7. Regarding claims 2-4, Wallin et al. disclose precursor compounds such as clay, zeolites, alumina, silica, aluminum trifluoride, fluorotopaz; preferably, clay, silica, alumina and mixture thereof; most preferably, the clay and alumina when forming a mullite porous catalyst support ([0045]).

8. Regarding claim 5, Wallin et al. teach that during heating the precursor compounds for forming mullite, fluorine is present in the atmosphere from sources such as SiF_4 ([0048]).

9. Regarding claim 6, Walling disclose that the metal used in the catalyst may be present in the form of an inorganic compound such as oxide, nitride, and carbide ([0031]).

10. Regarding claims 8 and 9, Walling et al. disclose that in a preferred catalyst, a metal element such as Ce, La, Ca, and even iron and scandium or a combination thereof is incorporated into the catalyst coating ([0031], [0032]).

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11. Regarding claim 10, Wallin et al. disclose metal elements such as Ce ([0032]).

12. Regarding claims 12, and 14-16, Wallin et al. disclose that the porous body, when making mullite, is generally heated for a first temperature for a time sufficient to convert the precursor compounds in the porous body to fluorotopaz and then raised to a second temperature sufficiently to form the mullite composition ([0049]). Furthermore, the prior art disclose that the first temperature is at least about 550°C, more preferably at least about 650°C and most preferably at least about 725°C to preferably at most about 850°C, more preferably at most about 800°C and most preferably at most about 775°C ([0049]). Moreover, the prior art disclose that the second temperature is at least about 1000°C to at most about 1700°C ([0050]).

13. Regarding claim 13, Wallin et al. disclose the presence of fluorine in the atmosphere from the source of SiF₄ while heating the precursor compounds to form mullite ([0048]).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin et al. as applied to claims 1-6, 8-10, and 12-16 above and further in view of US Patent No. 6,22,382 to Cutler et al.

Regarding claim 7, Wallin et al. disclose porous acicular mullite containing property enhancing compounds such as iron, magnesium, scandium, cerium, calcium and more and precursor compounds such as alumina, silica, aluminum trifluoride, fluorotopaz, and zeolite.

Wallin et al. does not disclose talc as one of the precursor compounds used to obtain the disclosed porous mullite.

Cutler et al., however, disclose that reaction sintered cordierite or mullite honeycomb bodies can be made by sintering or reaction-sintering an extruded green honeycomb made of appropriate ceramic powders, for example, powder formulations comprised of mullite or mullite precursors such as silica and alumina, or of cordierite or cordierite precursors such as talc (column 6, lines 19-26).

It would have been obvious to a person of ordinary skill in the art to modify Wallin et al. in order to include talc as one of the precursor compounds used to produce the intended porous mullite as that taught by Cutler et al. motivated by the fact that Cutler et al. disclose that the ceramic material utilized to form porous filter elements resists dissolution or other deterioration upon prolonged exposure to water and the reference discloses the above combination (with the existence of talc) as the preferred mullite bodies which are made as described above.

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16. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallin et al. as applied to claims 1-6, 8-10, and 12-16 above and further in view of JP Publication No. 01-172536 to Tadayoshi et al.

Regarding claim 31, Wallin et al. disclose a catalyst support of fused ceramic grains which are acicular mullite grain; also, Wallin et al. disclose different types of clays which are used as support and different kinds of metal used on this support.

Wallin et al., however, is silent to the use of both iron and magnesium in the claimed ratio in a mullite catalyst.

Tadayoshi et al. disclose a porous mullite base ceramic body to which an alloy was introduced which contained 0.8% Fe, and 0.7% Mg which results in a Fe/Mg ratio of 1.14 (Abstract). In addition, the reference discloses the use of the porous ceramic body in the diesel engines in which it helps to improve the heat resistance of the mixture.

It would have been obvious to a person of ordinary skill in the art to modify Wallin et al. in order to include the ratio of Fe/Mg as that taught by Tadayoshi et al. motivated by the fact that Tadayoshi et al. disclose that the incorporation of metals in a porous ceramic body motivated by the fact that the incorporation of metals in ceramic bodies as a continuous phase increases the strength of the ceramic.

Allowable Subject Matter

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17. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Although the prior art disclose the use of neodymium oxides with a support such as magnesia, mullite or a mixture thereof in a catalyst, they fail to disclose a ratio of Nd/Mg within the range of about 0.1 to about 10 by weight in a porous mullite composition.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent No. 3,676,370 to Stephens

US Patent No. 3,867,312 to Stephens

US Patent No. 3,839,225 to Acres

US Patent No. 4,329,162 to Pitcher, Jr.

US Patent No. 3,483,138 to Stephens et al.

JP Patent No. 63080852 to Matsumoto et al.

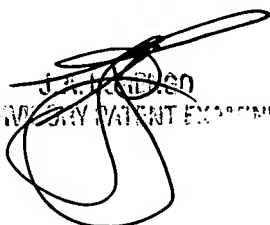
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pegah Parvini whose telephone number is 571-272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PP


J. A. KADEN
SUPERVISOR, PATENT EXAMINER